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Applicant(s): James K. Guenter		FEB 24 2005	

Application No. 09/577,034	Filing Date May 23, 2000	Examiner Hung T. Vy	Customer No. 022913	Group Art Unit 2828
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Invention: **SYSTEM AND METHOD FOR VCSEL POLARIZATION CONTROL**

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PATENT APPLICATION  
Docket No. 15436.434.6

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE  
THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re application of:	James K. Guenter and Jimmy A. Tatum	)
		)
Serial No.:	09/577,034	)
		)
Filed:	May 23, 2000	)
		) Art Unit
For:	SYSTEM AND METHOD FOR VCSEL POLARIZATION CONTROL	) 2828
		)
Examiner:	Hung T. Vy	)
		)
Appeal No.:	_____	)

The Honorable Commissioner of Patents  
and Trademarks  
Washington, D.C. 20231

**BRIEF OF APPELLANTS**

This is an appeal from the Final Office Action dated February 26, 2004, wherein the Examiner rejected claims 1-22. This Brief is being filed under the provisions of 37 C.F.R. § 1.192. This Brief is accompanied by the requisite fee of \$500 as set forth in 37 C.F.R. § 41.20(b)(2). The Commissioner is hereby authorized to charge any additional fees associated with this communication, or to credit any overpayment, to Deposit Account No. 23-3178.

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## **LIST OF REFERENCES**

### **U.S. Patent Documents**

U.S. Patent No. 6,069,905 to *Davis et al*  
U.S. Patent No. 6,302,596 to *Cohen et al.*  
U.S. Patent No. 6,567,435 to *Scott et al*  
U.S. Patent No. 5,331,654 to *Jewell et al*

## **I. REAL PARTY IN INTEREST**

The real party in interest comprises Finisar Corporation by way of assignment from Honeywell International, Inc. The assignment document was recorded in the United States Patent and Trademark Office at Reel/Frame 014484/0171 on March 26, 2004. The named inventors, James K. Guenter and Jimmy A. Tatum, who are captioned in the present application being examined, assigned their interest in the application to Honeywell International, Inc. This assignment document was recorded in the United States Patent and Trademark Office at Reel/Frame 011986/0046 on July 13, 2001.

## **II. RELATED APPEALS AND INTERFERENCES**

None.

## **III. STATUS OF CLAIMS**

Claims 1-22 are pending in this application. Claims 1-22 were rejected in the Final Office Action dated February 26, 2004.

## **IV. STATUS OF AMENDMENTS**

The Appellant did not submit any amendments subsequent to the Final Rejection.

## V. SUMMARY OF INVENTION

Exemplary embodiments of the present invention provide an independent polarizing medium in proximity to an unmodified VCSEL and positioned in relation to the VCSEL such that the medium provides equal selection and attenuation of the VCSEL polarization states, maintaining approximately constant power output and providing light emission in a linear, pre-determinable, polarization direction.

In one embodiment, a vertical cavity surface emitting laser component includes a package base which has a first self-aligning feature formed therein for indicating an alignment axis (*see* Figures 3A and 3B, and Specification at page 10, lines 16-25) . A vertical cavity surface emitting laser device, having two emission polarizations normal to one another is disposed upon the package base and aligned such that each emission polarization is at about 45 degrees with respect to the alignment axis (*see* Figure 3C and Specification at page 11, lines 1-9). A package cover, having a second self-aligning feature and an upper surface aperture formed therein, is coupled to the package base such that the first and second self-aligning features matably engage. A linear polarization element, having a polarization direction, spans the aperture such that the polarization direction is parallel to the alignment axis (*see* Figures 4A-4C and Specification page 11, lines 11-22). Proper orientation of the linear polarization element will equally select and attenuate the emission polarizations of the laser. In one embodiment, the orientation should be at about 45 degrees to both directions 204 (*see* Figure 2(a)), which is parallel to the (001) or (010) crystal planes (*see* Specification at page 9, lines 12-15). As noted in the Specification at page 10, lines 12-14: "The configuration and positioning of each of these elements provides for ease of alignment of a polarization component according to the present invention."

One example of a polarization element is a self-adhesive sheet that can be readily be disposed upon and removed from the upper surface of the VCSEL (*see* Figures 3A and 3C), much like a decal. A polarization element can also include a pane-like structure positioned above the upper surface of VCSEL 308 and supportively affixed to either the sensing element or the base 302. In other embodiments, a polarization element according to the present invention can be associated with the VCSEL entirely external to and independent from the component 300, and merely placed in the optical emission path thereof (*see* Specification at page 12, lines 7-14).

## VI. ISSUES

- Issue 1: Whether claims 1-14, 15-19 and 22 are unpatentable under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
- Issue 2: Whether claims 1, 2, 4-7, 10-12, 15-19, 21 and 22 are unpatentable under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,069,905 to *Davis et al* (hereinafter referred to as "*Davis*"), or by U.S. Patent No. 6,302,596 to *Cohen et al* (hereinafter referred to as "*Cohen*"), or by U.S. Patent No. 6,567,435 to *Scott et al* (hereinafter referred to as "*Scott*").
- Issue 3: Whether claims 3, 8, 9, 13, 14, and 20 are unpatentable under 35 U.S.C. §103(a) as being obvious over *Davis*, *Cohen* or *Scott*, in view of U.S. Patent No. 5,331,654 to *Jewell et al* (hereinafter referred to as "*Jewell*").

## VII. GROUPING OF CLAIMS

Independent claims 1, 15, and 20-22 stand separately and will be discussed separately with respect to each of the rejections identified in the Issues above. As to the 35 U.S.C. § 112, § 102(e), and § 103(a) rejections identified above, dependent claims 2-9 stand or fall together, dependent claim 10 is separately patentable, dependent claims 11-14 stand or fall together, and dependent claims 16-19 stand or fall together. Arguments why these dependent claims are separately patentable are provided in Section VIII below.



## VIII. ARGUMENTS

A. **Issue 1: Whether claims 1 -14, 15-19 and 22 are unpatentable under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

1. **The Examiner has failed to apply the correct legal standard concerning rejections under 35 U.S.C. § 112, second paragraph, to show that the claims are indefinite.**

In paragraph 2 of the Final Office Action, regarding claims 1 and 15, the Examiner states:

[T]he phase (sic) "a polarization medium positioned in proximal relation to the laser source element for polarizing the light output in third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally" renders the claims indefinite because the claims recite only a laser source element and a polarization medium without the recitation the structure of device and any polarization configuration in order to perform how the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally and perform the polarization control the optical energy source (sic). *Emphasis added.*

Applicant respectfully disagrees with this characterization of the claim as having insufficient structure and being, therefore, indefinite.

It appears that the Examiner is equating claim breadth with indefiniteness. However, and as noted in *In re Miller*, 441 F.2d 689,169 USPQ 597 (CCPA 1971), claim breadth is not to be equated with indefiniteness. If the scope of the subject matter embraced by the claims is clear, and if applicants have not otherwise indicated that they intend the invention to be of a scope different from that defined in the claims, then the claims comply with 35 U.S.C. § 112, second paragraph. (*see* MPEP § 2173.04).

A claim is sufficiently definite if “one skilled in the art would understand the bounds of the claim when read in light of the specification.” *Allen Eng'g Corp. v. Bartell Indus.*, 299 F.3d 1336, 1348 (Fed. Cir. 2002) (*quoting Personalized Media Comms., L.L.C. v. ITC*, 161 F.3d 696, 705 (Fed. Cir. 1998)). Claim 1 recites specific structure including: (1) a laser source element; (2) a polarization medium; (3) wherein the polarization medium is positioned in proximal relation to the laser source element so as to select and attenuate each of the at least two polarization states equally or substantially equally. In terms of a laser source element, the specification clearly provides one specific example of a Vertical Cavity Surface Emitting Laser (VCSEL), and further notes that “the same [inventive] system can be applied in other applications where multiple polarization light sources are utilized” (*see* Specification at page 7, lines 20-21). Likewise, the specification clearly provides several examples of a polarization medium, including the use of a die cut polarization material, a polymer based polarizer, and etched diffraction element or a formed film-type holographic element (*see* Specification at page 12, lines 2-5). With respect to claim 15, the recitation of a VCSEL element is specifically recited in the claim itself.

As stated in both claims 1 and 15, the recited structure is positioned to “polarize the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally”. In more generic terms, the structural elements are positioned to perform a specific function. Such functional claim language is clearly not indefinite. As noted in MPEP § 2173.01: “Applicant may use functional language, alternative expressions, negative limitations, or any style of expression or format of claim which makes clear the boundaries of the subject matter for which protection is sought (Emphasis Added). As noted in *In re Swinehart*, 439 F.2d 210, 160 USPQ 226 (CCPA 1971), a claim may not be

rejected solely because of the type of language used to define the subject matter for which patent protection is sought.”

While the claims may be broad, the claim language clearly defines the boundaries of what Applicants regard as the invention. Furthermore, the language satisfies the primary purpose of the requirement of definiteness of claim language by clearly informing the public of the boundaries of what constitutes infringement of the patent. The meaning of the claims is clearly discernable. The Federal Circuit has held that “if the meaning of the claim is discernible, “even though the task may be formidable and the conclusion may be one over which reasonable persons will disagree, we have held the claim sufficiently clear to avoid invalidity on indefiniteness grounds.” *Exxon Research & Eng'g Co. v. United States*, 265 F.3d 1371, 1375 (Fed. Cir. 2001).

**2. The Examiner’s indefiniteness rejection attempted to improperly limit the claims to the specific embodiment shown in Figures 3a-4c of the application.**

In paragraph 2 of the Final Office Action, the Examiner further states: “The sole recitation of a laser source element and a polarization medium in the claim fail to conform [sic] any clear polarization control optical energy source to further limit the invention as shown in figures 3a-4c.” Such a limitation is not required under any of the rules of claim construction and interpretation. The Federal Circuit has consistently rejected this approach to claim construction. Most recently, in *Leibel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004), the court stated:

[T]his court has expressly rejected the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment. *See ACTV, Inc. v. Walt Disney Co.*, 346 F.3d 1082, 1091 (Fed. Cir. 2003);

*Apex Inc. v. Raritan Computer, Inc.*, 325 F.3d 1364, 1377 (Fed. Cir. 2003); *Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1373 (Fed. Cir. 2003); *Tex. Digital Sys., Inc. v. Telegenix, Inc.*, 308 F.3d 1193, 1204-05 (Fed. Cir. 2002); *Teleflex, Inc. v. Ficos N. Am. Corp.*, 299 F.3d 1313, 1327 (Fed. Cir. 2002); *SRI Int'l v. Matsushita Elec. Corp. of Am.*, 775 F.2d 1107, 1121 n.14 (Fed. Cir. 1985) (en banc). Even when the specification describes only a single embodiment, the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using "words or expressions of manifest exclusion or restriction." *Teleflex*, 299 F.3d at 1327.

Consequently, the claims need not be limited to the specific structure illustrated in the embodiments shown in Figures 3a-4c. The Examiner's contentions to the contrary are clearly not supported by the case law.

3. **The 35 U.S.C. § 112, second paragraph, rejections were withdrawn in the Office Action dated May 20, 2003, and improperly reinstated in the Office Action dated October 6, 2003, since no amendments were made to the claims after the May 20, 2003 Office Action.**

The Office Action dated February 28, 2003 included the identical 35 U.S.C. § 112, second paragraph, rejections as those discussed above. Applicant's Amendment dated March 27, 2003 presented compelling arguments for the withdrawal of these rejections. In the Office Action of May 20, 2003, these rejections were withdrawn. Applicant argued in the Response dated July 9, 2003 that the Office Action of May 20, 2003 was improperly made final. After some discussion, this Final Office Action was withdrawn. However, in the next Office Action, dated October 6, 2003, the identical 35 U.S.C. § 112, second paragraph, rejections were reinstated. Applicant made absolutely no claim amendments between the Response of March 27, 2003 and the October 6, 2003 Office Action.

Applicant does not understand, and the Examiner provided no reasons, as to why these 35 U.S.C. § 112, second paragraph rejections were reinstated, after being withdrawn, even though

no claim amendments were made. Applicant further notes that the Examiner did not address any of the arguments presented above in the Response to Arguments section (Para. 10) of the Final Office Action

**4. Claim 22 is an independent claim, not dependent on either rejected base claim 1 or 15.**

On page 3 of the Office Action, in the first full paragraph, the Examiner states: "Claims 2-19 and 22 depend from rejected claims 1 and 15 thereby render these dependent claims indefinite." Claims 20, 21, and 22 are all independent claims. However, the language used in claim 22 is similar to that discussed above with respect to claims 1 and 15. Arguments presented above with respect to claims 1 and 15 apply equally to independent claim 22.

For at least the reasons presented above, independent claims 1, 15 and 22 fully and completely meet the requirements of the second paragraph of 35 U.S.C. § 112 because one skilled in the art would understand the bounds of the claim when read in light of the specification. Therefore these rejections should be overruled by the Board. Therefore, dependent claims 2-14 and 16-19 also fully and completely meet the requirements of the second paragraph of 35 U.S.C. § 112.

**B. Issue 2: Whether claims 1, 2, 4-7, 10-12, 15-19, 21 and 22 are unpatentable under 35 U. S. C. § 102(e) as being anticipated by *Davis*, or by *Cohen*, or by *Scott*.**

Paragraph 5 of the final Office Action states:

Regarding to claims 1, 5, 10, and 21, Davis et al. discloses a polarization controlled optical energy source, comprising:

A laser source (10) that produces a light output that has one and/or both of at least two polarization states (see Fig 3 and see column 4, line 45-64); and polarization medium (37) positioned in proximal relation to the laser source element (See column 5, line 1-32). It is inherent that at an incidence angle of the light to medium then the polarization medium is selecting and attenuate each of the at least two polarization states equally or substantially equally and provide linear polarization along an axis that is at about 45 degrees to both distinct polarization states (see fig. 1,3).

Paragraph 5 further states: “With respect to claims 15-19 and 22, the methods for VCSEL polarization control are considered as product by process steps.” The Examiner provided no further explanation concerning these “product by process” rejections.

Paragraph 6 of the final Office Action states:

Regarding to claims 1, 5, 10, and 21, Cohen et al. discloses a polarization controlled optical energy source, comprising: a laser source (134) that produces a light output that has one and/or both of at least two polarization states (see Fig 2 and all the laser source have two polarization as photons in there (*sic*) dimensional space with at least two polarization states as p and s); and polarization medium (140) positioned in proximal relation to the laser source element (See fig. 2). It is inherent that at an incidence angle of the light to medium then the polarization medium is selecting and attenuate each of the at least two polarization states equally or substantially equally and provide linear polarization along an axis that is at about 45 degrees to both distinct polarization states (see fig. 2).

Finally, paragraph 7 of the final Office Action states:

Regarding to claims 1, 5, 10, and 21, Scott et al. discloses a polarization controlled optical energy source, comprising: a laser source (36) that produces a light output that has one and/or both of at least two polarization states (see Fig 4 and all the laser source have two polarization as photons in there (*sic*) dimensional space with at least two polarization states as p and s); and

polarization medium (42) positioned in proximal relation to the laser source element (See fig. 4, 5,6 or 9). It is inherent that at an incidence angle of the light to medium then the polarization medium is selecting and attenuate each of the at least two polarization states equally or substantially equally and provide linear polarization along an axis that is at about 45 degrees to both distinct polarization states (see fig. 2,4, 5,6 or 9).

Each of these rejections will be discussed separately below.

**1. Discussion of the *Davis* patent. *Davis* fails to disclose each and every claim limitation of independent claims 1 and 21.**

Claim 1 recites:

A polarization controlled optical energy source comprising:

a laser source element that produces a light output that has at least two polarization states; and

a **polarization medium** positioned in proximal relation to the laser source element **for polarizing the light output in a third polarization state *that selects and attenuates each of the at least two polarization states equally or substantially equally.***

Similarly, claim 21 recites “polarization means for polarizing the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally.”

The *Davis* patent is directed to a VCSEL having intensity control. In the *Davis* patent, “[a] photo detector or diode, reflective window and feedback device are used to detect, monitor and control the vertical cavity surface emitting laser (VCSEL) output . . . ” (col. 1, lines 28-31). The *Davis* design provides a photodetector, and a tilted window that “is coated for reflecting some of the light emitted from the VCSEL back to the detector and for inhibiting external light from entering the can” (col. 1, lines 49-51). The Summary Section of the *Davis* patent further states:

The electrical power to the VCSEL is controlled in accordance with a feedback circuit via the detected light reflected back to the photo detector or diode. Maintaining power out of the VCSEL requires a linear relationship between the feedback and the VCSEL output. This relationship is accomplished with particular geometries of detected VCSEL light on the detector via a location of the detector and window reflector relative to the VCSEL.

*Davis*, col. 1, lines 56-64. Simply restated, the *Davis* patent uses a measurement of a portion of the light reflected off of a tilted window above the laser to adjust the laser power settings. As discussed in more detail below, the transmittance and reflectance taught by *Davis* is fundamentally different than the polarization recited in the claims at issue.

It is well settled in Patent Law that each and every claim limitation must be shown in a single prior art reference in order for that reference to anticipate a claim under 35 U.S.C. § 102. The following quotes provide a small sampling of the case law on this issue. “Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim.” *Lindemann Maschinenfabrik GMBH v. American Hoist and Derrick Co.*, 730 F.2d 1452, 1458 (Fed. Cir. 1984). “Anticipation requires that every element of the claim be found in a single prior art reference.” *See In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999). “In order for there to be anticipation, there must be no difference between the claimed invention or method and the reference disclosure, as understood by one of ordinary skill in the art.” *Scripps Clinic & Research Found. v. Genentech, Inc.*, 927 F.2d 1565, 1576 (Fed. Cir. 1991).

It is undisputed that the *Davis* patent does not teach or suggest “a polarization medium positioned in proximal relation to the laser source element for polarizing the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally,” as is positively recited in independent claim 1. Similar



language is used in independent claim 21. In fact, as discussed in more detail below, Davis actually teaches away from this express limitation by teaching that polarization effects should be minimized.

Furthermore, beginning at col. 5, line 12, *Davis* teaches:

If a VCSEL shifted from emitting exclusively P-polarized light to emitting exclusively S-polarized light (an event which has been observed to occur), the reflectance would increase from 35 percent to 42 percent (a factor of  $0.42/0.35=1.23$ ), and the transmittance would decrease from 26 percent to 22 percent (a factor of  $0.22/0.26=0.85$ ).

*Davis*, col. 5, lines 12-21. Even assuming, *arguendo*, that *Davis* teaches the use of a polarizing element as required in the claims at issue (which *Davis* does not), *Davis* clearly contemplates and acknowledges variations in both reflectance and transmittance as light emitted from the VCSEL shifts between P-polarized light and S-polarized light and relies instead on feedback circuitry to adjust the power output by the VCSEL. In other words, Davis does not teach or suggest, either expressly or inherently, the use of a “polarization medium . . . **for polarizing the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally**” as required in the claims at issue (emphasis added).

However, while the Examiner admits that *Davis* does not disclose the specific element listed above, the Examiner argues that the missing element is inherently found in the *Davis* patent. This argument is clearly erroneous, as it is unsupported by either the case law or the *Davis* disclosure.

“To establish inherency, the extrinsic evidence “must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.” *Continental Can Co. v. Monsanto Co.*, 948 F.2d

1264, 1268, 20 U.S.P.Q.2d 1746, 1749 (Fed. Cir. 1991) (emphasis added). “Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.” *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (additional citations omitted). Similarly, “The mere fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic.” *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art) (emphasis added).

Applicant would first like to point out that it is unclear from the discussion provided in the *Davis* patent if it is even possible for *Davis* to demonstrate “a polarization medium positioned in proximal relation to the laser source element for polarizing the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally”, as recited in the claims. In fact, the structure disclosed in *Davis* is specifically designed and intended to minimize polarization effects. For example, the Abstract of the *Davis* patent expressly states: “The tilted window has a metallic coating for partial reflection and for minimizing polarization effects on reflected and transmitted light.” Further, at col. 3, lines 6-9, the *Davis* patent teaches: “At the same time, the lateral extent of the thick dielectric must be minimized, because the optical transmission of such a thick coating will exhibit significant polarization selectivity.” *Davis* further teaches: “Any tilted reflector results in some polarization sensitivity; however, an appropriate thickness and proper choice of materials of the metallic coating on window 37 minimizes the polarization effects” (col. 4, line 67 to col. 5, line 3) (emphasis added).

Thus, *Davis* teaches it is desirable to minimize any polarization effects on the reflected and transmitted light. In addition, Applicants would like to point out that polarization selectivity in *Davis* does not mean “polarizing the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally,” as recited in claim 1. Rather, in *Davis*, polarization selectivity appears to mean selecting one polarization state over another. In the present case, there is no teaching, suggestion or indication whatsoever in *Davis* that the tilted window would significantly polarize the light output of the laser source. Even if it did, there is no teaching, suggestion or indication in *Davis* that the tilted window actually polarizes the light output of the laser source in a third polarization state that selects and attenuates each of the at least two polarization states of the laser source equally or substantially equally, as recited in claim 1. In fact, and as discussed above, *Davis* actually teaches away from such a construction.

Alternatively, even if it is possible for the structure disclosed in *Davis* to be misconstrued in such a fashion as to provide a polarization medium that allows for “polarizing the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally”, there is nothing in *Davis* to even remotely suggest that such a result is “necessarily present”, as required by the current case law cited above. If, by drastically manipulating the structure disclosed in *Davis*, it is possible to produce the claimed outcome, this clearly does not fit the definition of “necessarily present.” The Examiner is clearly basing his rejection on a highly questionable construction of *Davis* based on “optimization of conditions,” a process specifically rejected in *In re Rijckaert*, 9 F.3d at 1534.

As to dependent claim 10, it is independently patentable over the *Davis* reference. Dependent claim 10 positively recites “said polarization medium is aligned to provide linear

polarization along an axis that is at about 45 degrees to both distinct polarization states.” The Examiner finds that this limitation is inherent in the *Davis* reference as well. Applicant need not reiterate all of the case law that specifically limits the application of inherency, except to add that the 45 degree limitation cited above is not taught or suggested anywhere within *Davis*. Furthermore, it is not clear from the *Davis* specification whether or not the structure cited in *Davis* can ever meet this limitation. Even if the *Davis* disclosure can be construed in some un contemplated way, such a result does not necessarily follow from the *Davis* disclosure. Dependent claim 10 is, therefore, separately patentable from the independent claims already discussed.

The *Davis* rejection in the Office Action also included the following statement: “With respect to claims 15-19 and 22, the methods for VCSEL polarization control are considered as product by process steps.” The nature and/or basis for this rejection is unclear to the applicant. MPEP § 2173.05(p)(I) clearly states:

A product-by-process claim, which is a claim that defines the claimed product in terms of the process by which it is made, is proper. [citations omitted] A claim to a device, apparatus, manufacture or composition of matter may contain a reference to the process in which it is intended to be used without being objectionable under 35 U.S.C. 112, second paragraph, so long as it is clear that the claim is directed to the product and not the process.

*Id.* (emphasis added).

With respect to this rejection, Applicant first disputes that the cited claims are product-by-process claims. Claim 15 is clearly directed to a “method for VCSEL polarization control,” and claim 22 is similarly directed to a “method for providing a relatively constant light intensity output from a light source.” Both of these claims are method claims. Neither claim is directed to “[a] claim to a device, apparatus, manufacture or composition of matter,” (*see* MPEP § 2173.05(p)(I)), as is required in the definition of a product-by-process claim. Likewise, neither

claim is “a claim that defines the claimed product in terms of the process by which it is made” (see MPEP § 2173.05(p)(I)). Therefore, these rejections are inappropriate and improper.

However, even if the rejections are considered valid, both of independent claims 15 and 22 recite language similar to claim 1. Specifically, the claims recite “the third polarization state of the polarization medium selects and attenuates each of the at least two polarization states equally or substantially equally.” As discussed above, this limitation is not shown, either expressly or inherently, in the *Davis* patent.

Finally, with respect to the *Davis* patent, Applicants note that this is the same rejection made by the Examiner in the Office Actions dated February 28, 2003 and September 24, 2002, which were eventually withdrawn by the Examiner and replaced with a new rejection in the Office Action dated May 20, 2003.

For at least all of the reasons listed above, independent claims 1, 15, 21 and 22 are clearly patentable over *Davis*. Furthermore, dependent claim 10 is independently patentable over *Davis* for the reasons discussed above.

**2. Discussion of the *Cohen* patent. *Cohen* fails to disclose each and every claim limitation of independent claims 1 and 21.**

The *Cohen* patent is directed to small form factor optoelectronic transceivers. More specifically, *Cohen* describes optical sub-assemblies for use with small form factor (SFF) lucent connector (LC) applications (see col. 5, lines 36-37). The *Cohen* specification and claims specifically discuss the design and physical structure of optical sub-assemblies and/or transceiver modules. After careful reading of the reference, Applicants find little evidence of even a general discussion of “Systems and Methods of VCSEL Polarization Control,” which is the subject of the application and claims currently being appealed, anywhere in the *Cohen* patent.

Interestingly, the words “polarize” and “polarization” are not mentioned anywhere within the *Cohen* patent.

As previously noted, in order for a reference to anticipate a claim, each and every claim limitation must be shown in the reference. For the sake of brevity, Applicant will not repeat the numerous references cited in the discussion of *Davis* above. Claim 1 specifically recites “a polarization medium positioned in proximal relation to the laser source element for polarizing the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally.” The Examiner’s rejection states that *Cohen* discloses “polarization medium (140) positioned in proximal relation to the laser source element (See fig. 2)”. However, *Cohen* makes no such disclosure. The only mention of reference numeral 140 in the application specifically states: “A tilted window 140 is shown for TOSA 100 in FIG. 2” (col. 7, ll. 1-2). There is no further discussion of this element anywhere in the *Cohen* patent. Nothing in *Cohen* even remotely suggests that the tilted window 140 affects polarization at all. However, even assuming that the tilted window 140 could be a polarization medium, nothing in *Cohen* even suggests, let alone specifically discloses, that such a window polarizes “the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally.”

Once again, the Examiner relies on an inherency argument: “It is inherent that at an incidence angle of the light to medium then the polarization medium is selecting and attenuate each of the at least two polarization states equally or substantially equally and provide linear polarization along an axis that is at about 45 degrees to both distinct polarization states (see fig. 2).” As previously discussed with respect to the *Davis* patent, in order for something to be inherently disclosed, it must be “necessarily present” in the cited art. Mere possibility or

probability are not enough (*see* citations provided above at page 16). Nothing in *Cohen* even remotely suggests that the claimed result is “necessarily present,” as required by the current case law cited above. If, by drastically manipulating the structure disclosed in *Cohen*, it is possible to produce the claimed outcome, this clearly does not fit the definition of “necessarily present.” As with *Davis*, the Examiner is clearly basing his rejection on a highly questionable construction of the *Cohen* disclosure based on an “optimization of conditions,” a process specifically rejected in *In re Rijckaert*, 9 F.3d at 1534.

**3. Discussion of the *Scott* patent. *Scott* fails to disclose each and every claim limitation of independent claims 1 and 21.**

*Scott* discloses: “A plastic encapsulated VCSEL and power monitoring system wherein the VCSEL and photodetector are encapsulated in an optoelectronic plastic molding material” (*see* Abstract). *Scott* is similar to *Davis* in that it uses a tilted window “to reflect a portion of the optical beam back to the photodetector” for feedback control of the power output (*see* Abstract). After a careful reading of the reference, Applicant can find little evidence of even a general discussion of “Systems and Methods of VCSEL Polarization Control,” which is the subject of the application and claims currently being appealed, anywhere in the *Scott* patent. As with the *Cohen* reference, the words “polarize” and “polarization” are not even mentioned anywhere within the patent.

As previously noted, in order for a reference to anticipate a claim, each and every claim limitation must be shown in the reference. For the sake of brevity, Applicant will not repeat the numerous references cited in the discussion of *Davis* above. Claim 1 specifically recites “a polarization medium positioned in proximal relation to the laser source element for polarizing the light output in a third polarization state that selects and attenuates each of the at least two

polarization states equally or substantially equally.” The Examiner’s rejection states that *Scott* discloses “polarization medium (42) positioned in proximal relation to the laser source element (See fig. 4, 5, 6, or 9).” However, *Scott* makes no such disclosure.

According to the specification:

A translucent, preferably glass window 42 with the same degree of tilt as the angled cap is mounted on the cap by any suitable means, such as by adhesive 44 to cover the aperture 46. The tilted window has the effect of reflecting a substantial portion of the light at both low and high current toward the photodetector, which in turn enables controlled feedback. (col. 5, ll. 14-21)

As with the *Davis* patent, the purpose of the window 42 in the *Scott* patent is to reflect a portion of the light toward a photodetector, which then allows the power of the beam emitted by the laser to be monitored and adjusted. As with the *Cohen* patent, the *Scott* patent simply does not discuss the use of a “polarization medium,” as required in the claim. In fact, Figure 9 of the *Scott* patent, which is similar in construction to the embodiment in Figure 4, specifically states:

The ledge is positioned to house a tilted window beamsplitter 118 in optical alignment with the VCSEL for reflecting a portion of the radiated light toward the photodiode 106. The window is preferably glass. The index of refraction of the glass, in conjunction with the indices of refraction of air in the recess and the plastic encapsulation, provides the necessary refraction to appropriately direct a representative sample of the radiated beam onto the photodetector while transmitting an undistorted beam into the output.

Col. 6, lines 54-63 (emphasis added). This specifically teaches away from a polarization medium “for polarizing the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally,” as positively recited in claim 1. As with the previous two references, the Examiner is once again relying on a highly questionable construction of *Scott* based on an “optimization of conditions,” a process specifically rejected in *In re Rijckaert*, 9 F.3d at 1534.



For at least the reasons outlined above, independent claims 1, 15, 21 and 22 are, therefore, patentable over the cited art. Likewise, claims 2, 4-7, and 10-12, which depend from claim 1, and claims 16-19, which depend from claim 15, are also patentable. Finally, dependent claim 10 is separately patentable for the reasons presented above.

- C. **Issue 3: Whether claims 3, 8, 9, 13, 14, and 20 are unpatentable under 35 U.S.C. 103(a) as being obvious over Davis et al, U.S. No. 6,069,905, Cohen et al., U.S. Patent No. 6,302,596 or by Scott et al., U.S. Patent No. 6,567,435 in view of Jewell et al, U.S. Patent No. 5,331,654.**

Paragraph 9 of the final Office Action states:

Regarding claims 3, 8, 9, 13, 14, and 20, Davis et al. or Cohen et al. or Scott et al. disclose a polarization controlled optical energy source with a package base, a vertical cavity surface emitting laser device, package cover, and polarization medium but Davis et al. or Cohen et al. or Scott et al. do not disclose polarization medium (37) provides linear polarization, laser source element has two distinct polarization states that are normal to one another, polarization medium is formed from a sheet polarization material. However, Jewell et al. disclose polarization medium 68 provides linear polarization (See column 7, line 19-27), the source, wherein said polarization medium provides linear polarization (See column 7, line 19-27), laser source element has two distinct polarization states that are normal to one another (See column 4, line 33 – 36 and Fig 10), and polarization medium is formed from a sheet polarization material. See column 4, line 39 - 55.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Davis et al. to have linear polarization and a sheet polarization material that of Jewell et al., because those skilled in the art will recognize that such modification and variations can be made without departing from the spirit of, but further increasing the performance of, the invention of Jewell et al.

1. **Davis is disqualified as prior art under § 103a, in light of § 103c.**

The *Davis* patent was filed on December 31, 1997, and issued on May 30, 2000. The present application was filed on May 23, 2000. As such, *Davis* would only qualify as prior art under 35 U.S.C. § 102(e), which was the basis of the § 102 rejections previously discussed. In view thereof, the Examiner's rejection of claims 3, 8, 9, 13, 14, 20 and 22 must have been made under 35 U.S.C. § 102(e)/103. However, 35 U.S.C. § 103(c)(1) states:

Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section [*i.e.*, section 103] where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. (emphasis added)

35 U.S.C. 103(c)(1) applies to all utility, design and plant patent applications filed on or after November 29, 1999, which includes the present application. The subject matter of *Davis* and the subject matter of the present application were, at the time the invention was made, owned by or subject to an obligation of assignment to a common assignee, namely, Honeywell International Inc., of Morristown, New Jersey, U.S.A. The specific assignment information for the present application is provided above. The assignment of the *Davis* patent was recorded in the United States Patent and Trademark Office at Reel/Frame 009721/0734 on January 28, 1999. In view of the foregoing, the *Davis* reference is disqualified as prior art under 35 U.S.C. § 103, and *Davis* cannot be cited as prior art, either alone or in combination with some other reference, under the obviousness statute.

- 2. With respect to dependent claims 3, 8, 9, 13, and 14, these claims depend from independent claim 1, which was not rejected, and are therefore, also non-obvious.**

The Examiner did not reject independent claim 1 as being obvious over any of the cited references. Therefore, claims 3, 8, 9, 13, and 14, dependent therefrom, are also non-obvious. No further information was provided in the rejection as to why the Examiner did not cite claim 1 in the § 103(a) rejection. Applicant believes that either (a) the Examiner is relying on the § 102 rejections previously discussed or (b) this was an oversight on the part of the Examiner. If case (a) is true, Applicant relies on the arguments made previously with respect to those rejections that positively show the cited references do not anticipate the claims. If case (b) is true, Applicant presents arguments below why the Examiner, using the cited references, either alone or in combination, has failed to make a *prima facie* case that the rejected claims are obvious under the statute.

Likewise, claims 13 and 14 depend from dependent claim 10, which was not rejected as obvious. If, as the Examiner admits, claim 10 is not obvious, then claims 13 and 14, dependent therefrom, are also non-obvious.

- 3. The cited references do not, alone or in combination, teach or suggest each and every claim limitation.**

While the discussion of the 103 rejection cited by the Examiner above does not specifically mention *Cohen* or *Scott*, Applicant will assume that the Examiner meant to reject all of the cited claims over either *Davis*, *Cohen* or *Scott* in view of *Jewell*. However, since *Davis* is disqualified as prior art under Section 103, as discussed above, Applicant will limit the discussion to *Cohen* or *Scott* in view of *Jewell*.

Applicant respectfully asks that because the Examiner has established an insufficient *prima facie* case of obviousness, that the Board reverse the Examiner's rejections. In the absence of a proper *prima facie* case of obviousness, an applicant who complies with the other statutory requirements is entitled to a patent. See *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

To set forth a *prima facie* case of obviousness the following elements must be shown, according to MPEP § 2143:

- (1) suggestion or motivation, either in the references themselves or in the knowledge available to one skilled in the art, to modify the reference or combine reference teachings;
- (2) a reasonable expectation of success; and
- (3) the combined references must teach or suggest all the claim limitations of the Appellant's claims.

The mere fact that the references can be combined is not sufficient to establish *prima facie* obviousness unless the prior art, in addition, suggests the desirability of the combination. See MPEP § 2143.01.

With respect to requirement (3) above, the Examiner has failed to show that the cited references, either alone or in combination, teach each and every limitation of the rejected claims. Specifically, the Examiner has ignored the limitation in claim 1 that positively recites "a polarization medium positioned in proximal relation to the laser source element for polarizing the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally". The Examiner has failed to address this element of the claim by showing specifically how the cited references teach or suggest this element. Applicant must therefore assume that either, the Examiner believes that this element is inherently disclosed in either the *Scott* or *Cohen* references, as cited above, or that this element is

somehow disclosed in the *Jewell* reference. With respect to the *Scott* and *Cohen* references, Applicants arguments concerning inherency apply here as well. The *Jewell* patent is discussed below.

The *Jewell* patent is drawn to:

A vertical-cavity, surface-emitting semiconductor diode laser having a monolithic and planar surface and having lateral anisotropy in order to control the polarization of the emitted beam of light. . . . The anisotropy may be provided by utilizing anisotropy in the atomic or molecular structure of the materials forming the laser, or by anisotropic patterning or deliberate offset alignment in processing of the laser or through anisotropic structures in the laser cavity to control the polarization of the emitted beam. (Abstract)

*Jewell* does not teach or suggest “a polarization medium positioned in proximal relation to the laser source element for polarizing the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally,” as recited in claim 1. Rather, *Jewell* specifically teaches the use of anisotropy in the laser cavity to prefer a specific polarization state:

Anisotropy in the laser cavity can be introduced into the materials comprising the laser. There are many ways in which material anisotropy in the optical cavity can give preference to one polarization state. If the material is birefringent, i.e., having different refractive indices for light polarized in different orientations, the cavity resonance will occur at different wavelengths for the two polarizations. One of these wavelengths will have greater overall gain in the cavity and will therefore be preferred. Thus one polarization state will be preferred and will dominate the lasing action.

Col. 4, lines 29-36 (emphasis added). As can be seen, *Jewell* suggests introducing anisotropy into the optical cavity or the active layer of a VCSEL to give a preference to one polarization state over the others, resulting in a single polarization light emission. As such, *Jewell* clearly does not suggest providing a polarization medium that is adapted to select and attenuate each of the at least two polarization states equally or substantially equally, as recited in claim 1. As

previously discussed, there is likewise nothing in either the *Cohen* or *Scott* references that teaches, suggests, or even discusses, this claim element.

To establish a *prima facie* case of obviousness, MPEP § 2143 also requires that the Examiner demonstrate “ suggestion or motivation . . . to modify the reference or combine reference teachings.” Where the references fail to even teach or suggest all the claim limitations as demonstrated above, it necessary follows that the Examiner has also failed to identify any suggestion or motivation to combine the references in the manner suggested by the Examiner in an attempt to construct an argument that the combined references render the rejected claims obvious.

The Examiner has, therefore, failed to establish a *prima facie* case of obviousness as to dependent claims 3, 8, 9, 13, and 14, since these claims depend from non-obvious claim 1.

With respect to independent claim 20, it recites:

A vertical cavity surface emitting laser component comprising:

a package base, having a first self-aligning feature formed therein for indicating an alignment axis, the alignment axis not necessarily being in-line with the self-aligning feature;

a vertical cavity surface emitting laser device, having at least two emission polarization states normal to one another, disposed adjacent the package base and aligned such that each emission polarization state is at about 45 degrees with respect to the alignment axis;

a package cover, having a second self-aligning feature and an upper surface aperture formed therein, coupled to the package base such that the first and second self-aligning features matably engage; and

a linear polarization element, having a polarization direction, spanning the aperture and disposed such that the polarization direction is parallel or substantially parallel to the alignment axis.

After careful review of the *Jewell* reference, Applicant can find no mention of “a package base, having a first self-aligning feature formed therein for indicating an alignment axis.” Likewise, there is no mention anywhere in *Jewell* of “a package cover, having a second self-aligning feature and an upper surface aperture formed therein, coupled to the package base such that the first and second self-aligning features matably engage,” as recited in claim 20. *Jewell* simply fails to teach or suggest this claim limitation anywhere in the patent.

Similarly, neither *Cohen* nor *Scott* teach or suggest this self-aligning feature. It is, quite simply, not mentioned in either reference.


Applicant therefore respectfully submits, for at least the reasons outlined above, that claims 3, 8, 9, 13, 14, and 20 are non-obvious and patentable as currently written.

## CONCLUSIONS

Based on the foregoing, Appellant respectfully requests that the Board reverse the Examiner's rejections of claims 1-22 pending in this application, which would then place this application in condition for immediate allowance.

DATED this the 24th day of February, 2005.

Respectfully submitted,



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## **IX. APPENDIX**

### **A. CLAIMS ON APPEAL**

1. (Previously Amended) A polarization controlled optical energy source comprising:  
a laser source element that produces a light output that has at least two polarization states;  
and  
a polarization medium positioned in proximal relation to the laser source element for polarizing the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally.
2. (Original) The source of Claim 1, wherein said laser source element is disposed within a component package having an emission aperture formed therein.
3. (Original) The source of Claim 2, wherein said polarization medium provides linear polarization.
4. (Previously Amended) The source of Claim 3, wherein said laser source element has multiple distinct polarization states oriented with respect to one another at angular intervals.
5. (Previously Amended) The source of Claim 4, wherein said polarization medium is aligned to provide linear polarization along an axis that equally selects and attenuates the distinct polarization states.

6. (Original) The source of Claim 1, wherein said laser source element is a vertical cavity surface emitting laser.
7. (Original) The source of Claim 6, wherein said vertical cavity surface emitting laser is disposed within a component package having an emission aperture formed therein.
8. (Original) The source of Claim 7, wherein said polarization medium provides linear polarization.
9. (Previously Amended) The source of Claim 8, wherein said laser source element has two distinct polarization states that are normal to one another.
10. (Previously Amended) The source of Claim 9, wherein said polarization medium is aligned to provide linear polarization along an axis that is at about 45 degrees to both distinct polarization states.
11. (Original) The source of Claim 10, wherein said polarization medium is affixed to the component package spanning the emission aperture.
12. (Original) The source of Claim 10, wherein said polarization medium is disposed within the component package between the vertical cavity surface emitting laser and the emission aperture.

13. (Original) The source of Claim 10, wherein said polarization medium is formed from a sheet polarization material.

14. (Original) The source of Claim 10, wherein said polarization medium is formed by the application of polymer-based polarization material.

15. (Previously Amended) A method for VCSEL polarization control comprising the steps of:

providing a VCSEL element that produces a light output that has one and/or both of at least two polarization states;

providing a polarization medium that polarizes the light output in a third polarization state; and

positioning the polarization medium in proximal relation to the VCSEL element so that the third polarization state selects and attenuates each of the at least two polarization states equally or substantially equally.

16. (Original) The method of Claim 15, wherein the step of providing a polarization medium further comprises providing a polarization medium that provides linear polarization.

17. (Previously Amended) The method of Claim 16, wherein the step of providing a VCSEL element further comprises providing a VCSEL element having two distinct polarization states that are normal to one another.

18. (Previously Amended) The method of Claim 17, wherein the polarization medium is aligned to provide linear polarization along an axis that is at about 45 degrees to both distinct polarization states.

19. (Original) The method of Claim 15 further comprising the steps of:

providing a component package having an emission aperture formed in a surface thereof;  
disposing the VCSEL element within the component package; and  
affixing the polarization medium to the component package spanning the emission  
aperture.

20. (Previously Amended) A vertical cavity surface emitting laser component comprising:
- a package base, having a first self-aligning feature formed therein for indicating an alignment axis, the alignment axis not necessarily being in-line with the self-aligning feature;
  - a vertical cavity surface emitting laser device, having at least two emission polarization states normal to one another, disposed adjacent the package base and aligned such that each emission polarization state is at about 45 degrees with respect to the alignment axis;
  - a package cover, having a second self-aligning feature and an upper surface aperture formed therein, coupled to the package base such that the first and second self-aligning features matably engage; and
  - a linear polarization element, having a polarization direction, spanning the aperture and disposed such that the polarization direction is parallel or substantially parallel to the alignment axis.

21. (Previously Amended) A polarization controlled optical energy source comprising:
- a laser source element for producing a light output that has one and/or both of at least two polarization states; and
  - polarization means for polarizing the light output in a third polarization state that selects and attenuates each of the at least two polarization states equally or substantially equally.

22. (Previously Amended) A method for providing a relatively constant light intensity output from a light source that produces a light beam that has at least two polarization states, the method comprising the steps of:

providing a polarization medium that polarizes the light beam in a third polarization state;

and

positioning the polarization medium in line with the light beam of the light source so that the third polarization state of the polarization medium selects and attenuates each of the at least two polarization states equally or substantially equally.

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